AMR-FCT10/01

FanCoil unit controller

Operation manual

Version 1.02

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Contents

History of revisions

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Revision	Date	Author of change	Changes
100	17. 05. 2012	Čeřovský L.	New document.
101	21. 07. 2012	Říha Z.	Correction of chapters 1, 2, 5.1, 6, 9, 10, figures correction.
102	23. 01. 2017	Říha Z.	Correction of chapter 2, manual structure change, figures update.

Related documentation

1. Help file for EsiDet part of DetStudio development environment
   file: Esidet_en.chm
2. Application note AP0005 – ARION network communication
   file: ap0005_en_xx.pdf
3. Application note AP0016 – Principles of RS485 interface usage
   file: ap0016_en_xx.pdf
4. Application note AP0025 – ARION network communication – definition by table
   file: ap0025_en_xx.pdf

1 Introduction

AMR-FCT10/01 is a small, compact programmable controller, intended for FanCoil unit operation.

Basic features

- 3 relay outputs
- 2 triac outputs
- 2 universal outputs Ni1000 / Pt1000 / contact
- 2 RS485 interface (galvanic isolation: 1 × yes, 1 × no)
- Mounting on a wall or to dropped ceiling

2 Technical parameters

CPU

CPU	ST32F103
FLASH	512 KB
RAM	64 KB
EEPROM	2 KB

RTD inputs [1])

Number of inputs	2
Inputs type [2])	Dry contact / Ni1000 / Pt1000
Common wire	AGND [3])
Galvanic isolation	No
Connection points	Cage clamp terminals WAGO 256
Wire cross section	0.08 mm^2 to 2.5 mm^2
Maximum inlet wire length	30 m

Input Ni1000 / Pt1000

Measured temperature range – Ni1000 (6180 ppm/°C) – Ni1000 (5000 ppm/°C) – Pt1000 (3850 ppm/°C)	 -35 °C to +120 °C -40 °C to +145 °C -45 °C to +205 °C
Accuracy [4]) – Ni1000 (6180 ppm/°C) – Ni1000 (5000 ppm/°C) – Pt1000 (3850 ppm/°C)	 ±0.5 °C ±0.6 °C ±0.8 °C
Input temperature dependence	70 ppm/°C

Dry contact

R_{min} for log. 0	> 1320 Ω
R_{max} for log. 1	< 1080 Ω

Note [1]) RTD is an abbreviation for English term “resistance temperature detector”. This type inputs can be used for temperature measurement through the resistive sensors or as dry contact digital inputs.

[2]) The way of RTD input use depends on an application created in DetStudio / EsiDet environment.

[3]) Terminal AGND is internally connected with controller terminal GND.

[4]) Valid for 25 °C. The accuracy depends on the measured value and it does not contain the accuracy of separated connected sensor.

Relay outputs

Number of outputs	3
Type	Switching relay contact
Contacts protection	Varistor
Galvanic isolation	Yes
GI insulation strength	4000 V AC
Nominal switched voltage	230 V AC / 24 V DC
Maximum switched current	4 A (resistance load)
Contact closing time	10 ms
Contact opening time	5 ms
Contact lifetime – without load – nominal load	 30×10^6 cycles 10^5 cycles

Maximum switching frequency – without load – nominal load	 72 000 / hour 360 / hour
Outputs protection	External circuit-breaker
Connection points	Cage clamp terminals WAGO 256
Wire cross section	0.08 mm^2 to 2.5 mm^2

Triac outputs

Number of outputs	2
Nominal switched voltage	230 V AC
Switched voltage frequency	50 Hz to 60 Hz
Switching current	Min. 25 mA Max. 500 mA
Outputs protection	External circuit-breaker
Galvanic isolation	Yes
Insulation strength	2500 V AC
Control method	ON / OFF
Connection points	Cage clamp terminals WAGO 256
Wire cross section	0.08 mm^2 to 2.5 mm^2

Power supply output

Nominal power supply voltage	24 V DC
Maximum power consumption	70 mA
Protection against short circuit	PTC
Connection point	Cage clamp terminals WAGO 256
Wire cross section	0.08 mm^2 to 2.5 mm^2

RS485

Quantity	2
Overvoltage protection	Transil 600 W
Galvanic isolation [5])	1 × Yes, 1 × No
Terminating resistor [6])	120 Ω on the unit
Idle state definition [6]) up to +5 V up to 0 V	 1 kΩ on the unit 1 kΩ on the unit
Maximum wire length	1200 m / 19200 bps
Max. number of stations on segment	256 (interface with GI) 32 (interface without GI)
Operation indication	LED on cover
Connection points	Cage clamp terminals WAGO 256
Wire cross section	0.08 mm^2 to 2.5 mm^2

Note [5]) Insulation strength is 2500 V against power supply terminals. Insulation strength is 500 V against electronics. Galvanic isolation against electronics must not be used for dangerous voltage separation.

[6]) Terminating resistor and idle state definition for interface COM0 are connected permanently. Terminating resistor and idle state definition are connected through configuration jumpers in case of interface COM1.

Power supply

Nominal power supply voltage	230 V AC
Power supply voltage range	207 V AC to 253 V AC
Maximum power consumption	0.056 A at 230 V AC [7])
Power dissipation (typical)	6.6 W
Connection point	Cage clamp terminals WAGO 256
Wire cross section	0.08 mm^2 to 2.5 mm^2

Notes [7]) Without connected inputs and outputs.

Mechanics	Mechanical design	Steel sheet, light grey
	Mounting	On the base plate
	Ingress protection rate	IP20
	Dimensions (w × h × d)	(157 × 95 × 50) mm
	Weight – netto – brutto	0.66 kg ±5 % 0.78 kg ±5 %

Temperatures	Operating temperature range	0 °C to 50 °C
	Storage temperature range	-20 °C to 70 °C

Others	Maximum ambient humidity	< 95 % non-condensing
	Programming	DetStudio / EsiDet

2.1 Dimensions

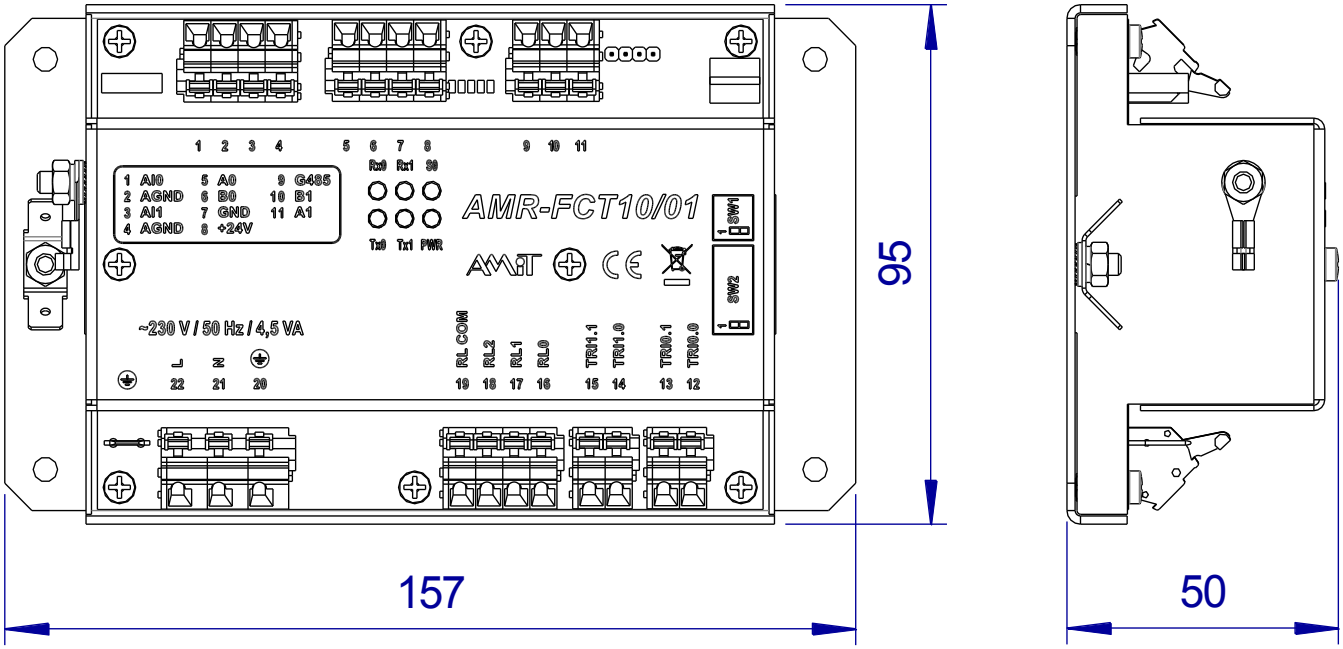

Fig. 1 – **AMR-FCT10/01** dimensions

2.2 Recommended drawing symbol

Following drawing symbol is recommended for the controller **AMR-FCT10/01**. Only part of it will be visible in following examples.

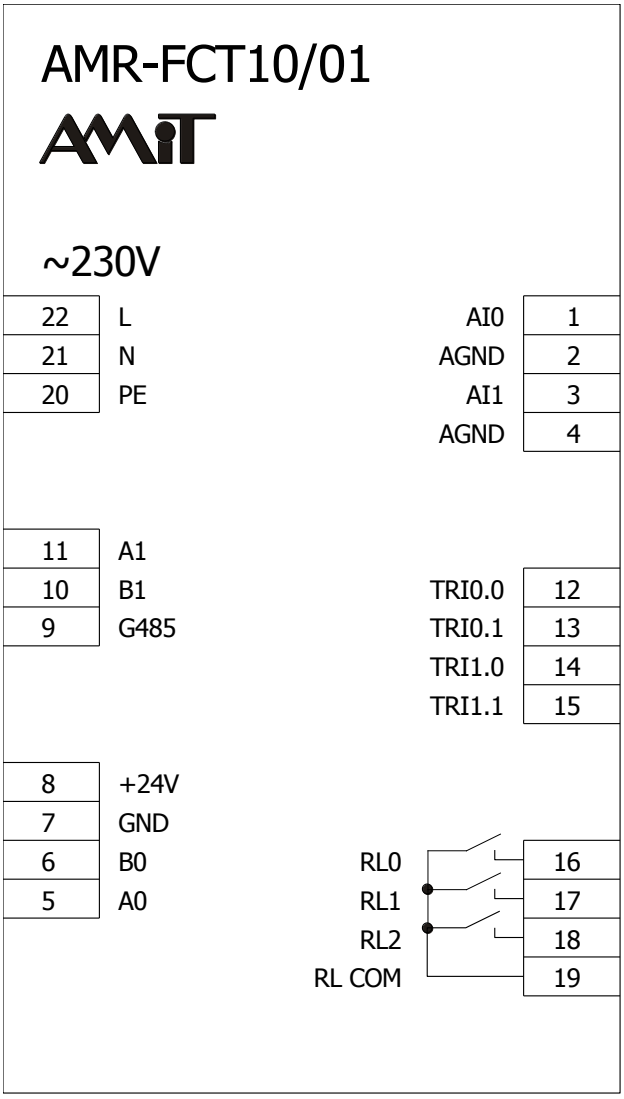

Fig. 2 – Recommended drawing symbol for **AMR-FCT10/01**

3 Conformity assessment

This equipment meets the requirements of NV616/2006 and NV17/2003 Czech Government Decree. The compliance assessment with NV616/2006 has been performed in accordance with harmonized standard EN 61326, compliance assessment with NV17/2003 has been performed in accordance with harmonized standard EN 61010-1:2010.

Tested in accordance with standard	Type of test	Classification
EN 55011:2009	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement	Complies (Class B)
EN 61000-3-3:2008	Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection	Complies [8])
EN 61000-4-2:2009	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Indirect electrostatic discharge immunity test, contact discharge	Complies (4 kV)
EN 61000-4-2:2009	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test, aerial discharge	Complies (8 kV)
EN 61000-4-3:2006	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test, 80 MHz to 1000 MHz	Complies (10 V/m)
EN 61000-4-3:2006	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test, 1400 MHz to 2000 MHz	Complies (3 V/m)
EN 61000-4-3:2006	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test, 2000 MHz to 2700 MHz	Complies (1 V/m)
EN 61000-4-4:2012	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test, power supply	Complies (±2 kV)
EN 61000-4-4:2012	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test, RS485	Complies (±1 kV)

Tested in accordance with standard	Type of test	Classification
EN 61000-4-4:2012	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test, analogue inputs	Complies (±1 kV)
EN 61000-4-5:2006	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test, power supply	Complies (±2 kV)
EN 61000-4-6:2009	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields	Complies (3 V)
EN 61000-4-11:2004	Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests	Complies
EN 61010-1:2010	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements	Complies

[8]) This is true, when any appliance being connected to the equipment outputs has the peak current consumption not greater than 0.9 A AC. It is necessary to review the compliance assessment again with EN 61000-3-3:2013 in terms of used software equipment, when the appliance has greater current consumption.

3.1 Other tests

Tested in accordance with standard	Type of test	Classification
EN 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold	Complies
EN 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat	Complies

4 Power supply

Power supply The programmable controller **AMR-FCT10/01** is power supplied from single-phase network 230 V AC. The controller must be protected externally through circuit breaker. Power supply voltage connection is indicated by LED PWR.

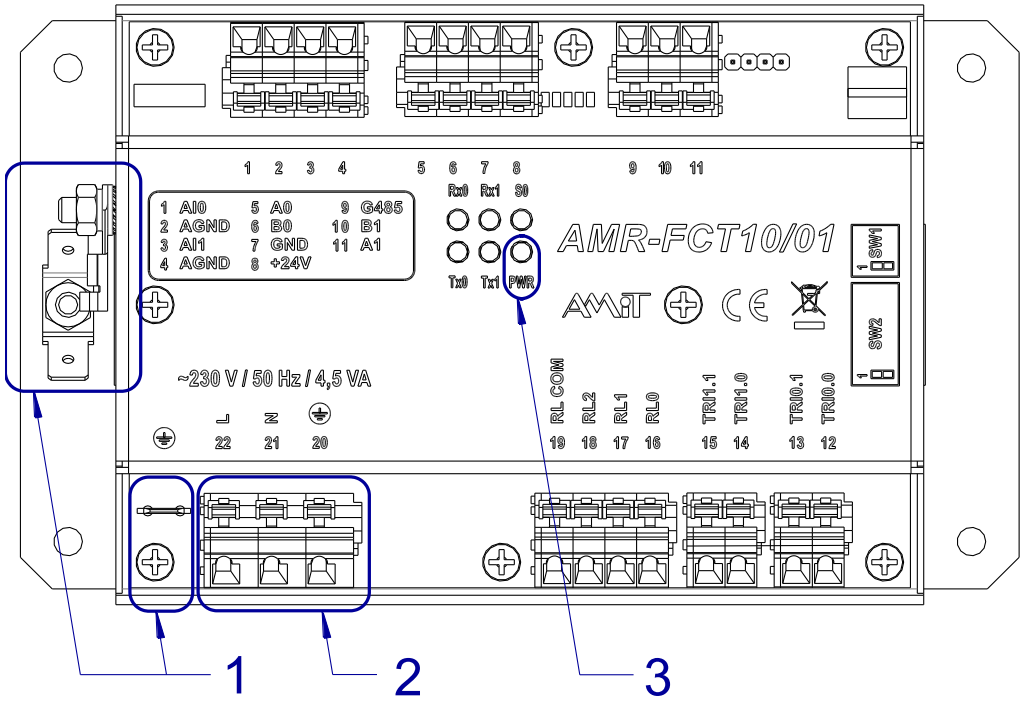

Fig. 3 – Terminals location for power supply

Legend

Number	Description
1	Terminals for connection between metal parts and protective conductor
2	Terminals for power supply
3	LED PWR

Terminals marking

Terminal	Signal	Description
20	⏚	Protective conductor
21	N	Neutral conductor
22	L	Phase conductor

Protective conductor The protective conductor terminal is connected to the metal mechanical components so that the protection against hazardous contact voltage is ensured. **The protective conductor must be always connected!!!**

LED states description

LED	Description
Lit	Power supply is connected
Not lit	Power supply is not connected

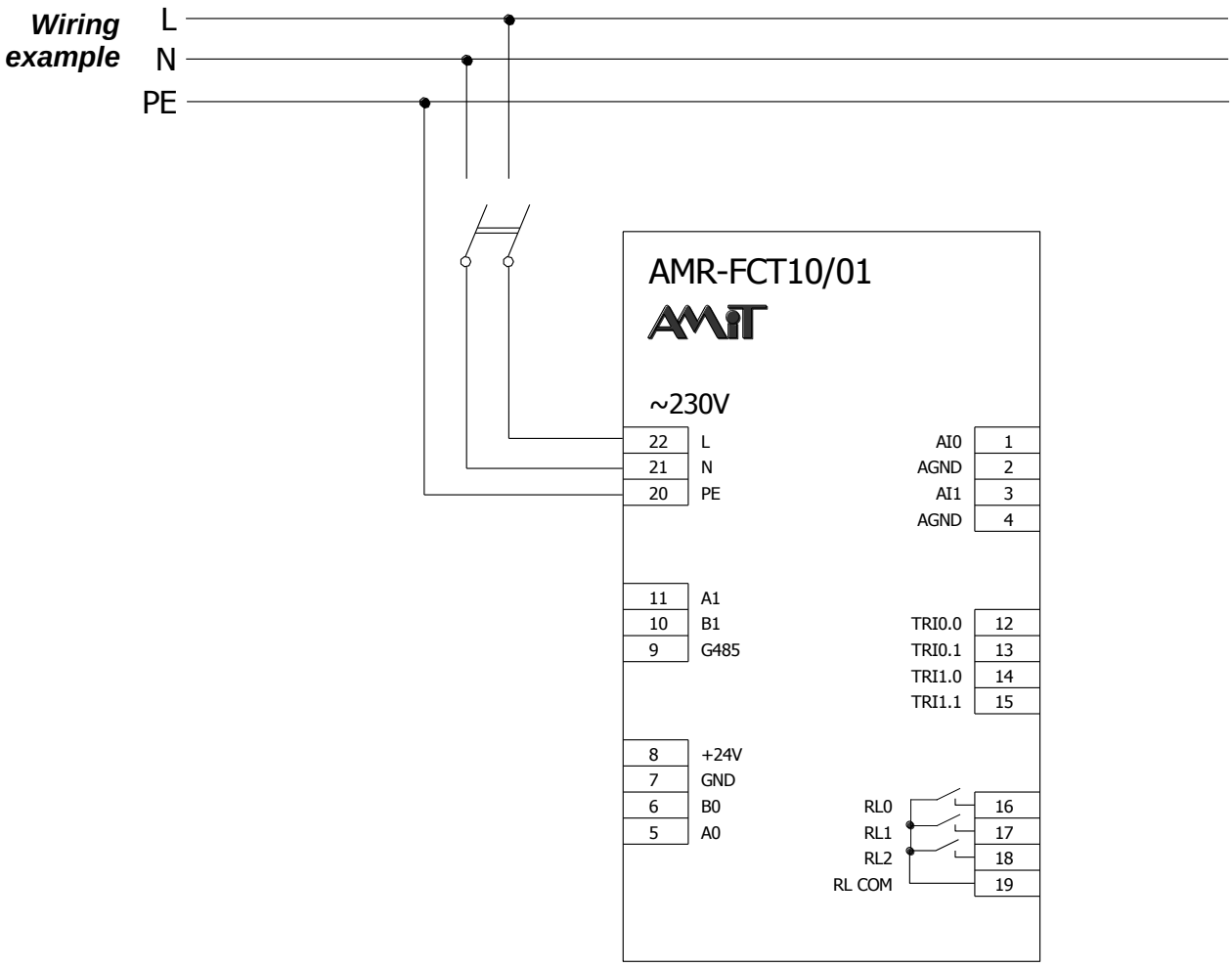

Fig. 4 – Power supply wiring example

5 Communication interfaces

The programmable controller **AMR-FCT10/01** is fitted with two RS485 communication interfaces. RS485 is a half-duplex serial interface. It is used for application loading into the controller and can be also used for multiple stations connection. All stations communicate through single signal pair.

5.1 RS485 without galvanic isolation (COM0)

Up to 31 stations can be connected to RS485 without GI. The RS485 interface without galvanic isolation uses the common GND terminal together with power supply for external periphery. It can be used for communication with the on-wall controller of a type **AMR-OPxx**.

RS485 interface activity is indicated by LEDs located on front panel.

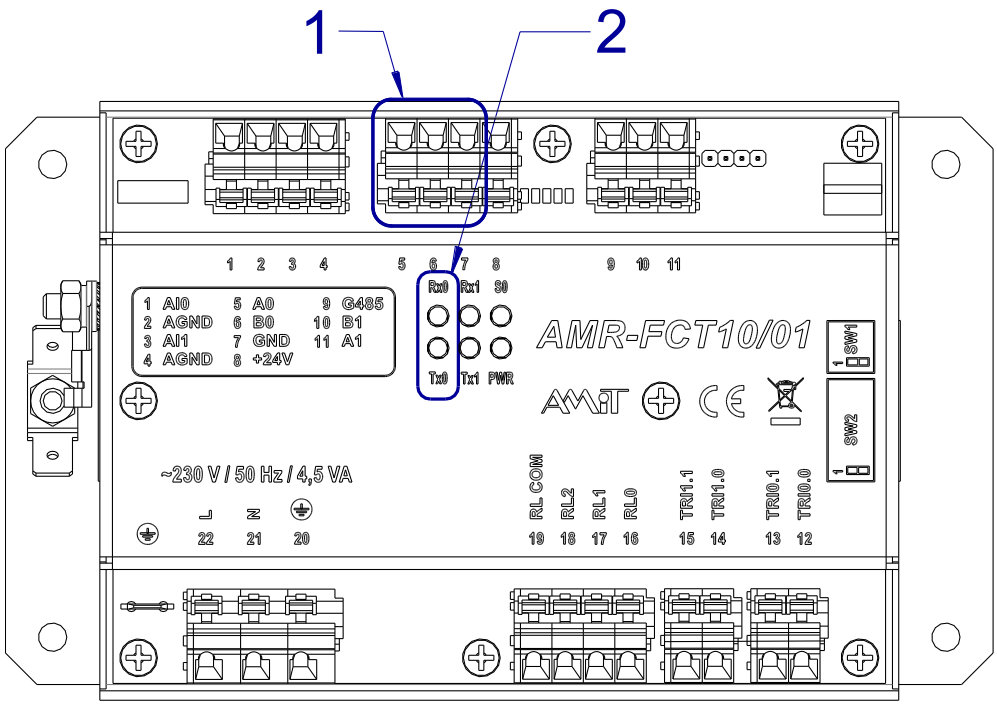

Fig. 5 – Terminals and LEDs location for RS485 without GI

Legend

Number	Description
1	Status LEDs for RS485 without GI
2	Terminals for RS485 without GI

Terminals wiring

Terminal	Signal	Description
5	A0	RS485 interface without GI, signal A
6	B0	RS485 interface without GI, signal B
7	GND	Common ground for both RS485 interface without GI and external periphery power supply

RS485 status LEDs

LED	Description
Rx0	Controller is receiving data
Tx0	Controller is transmitting data

Terminating resistor and idle state definition are permanently connected.

5.1.1 On-wall controller connection

Terminals 5 to 8 are typically used for the on-wall controllers connection of type **AMR-OPxx** from AMiT production. It is necessary to turn off the controller power supply voltage before the on-wall controller is connected.

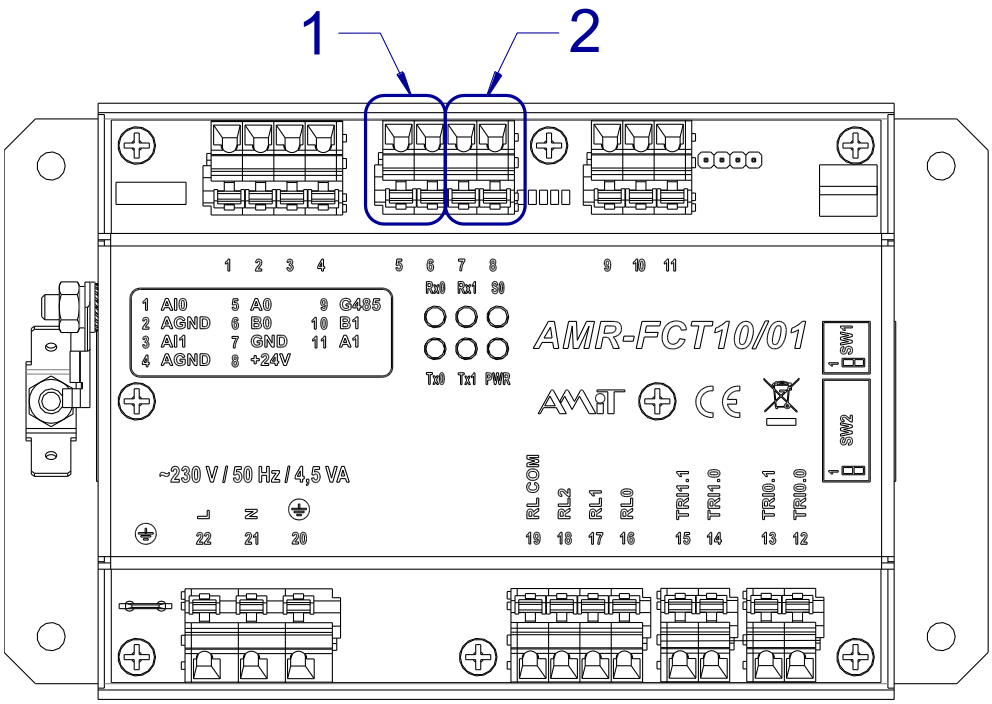

Fig. 6 – Terminals location for on-wall controller connection

Legend

Number	Description
1	Terminals for RS485 connection of on-wall controller
2	Terminals for power supply connection of on-wall controller

The controller is power supplied by 24 V DC from the controller **AMR-FCT10/01** and communicates through RS485 without galvanic isolation.

Wiring example

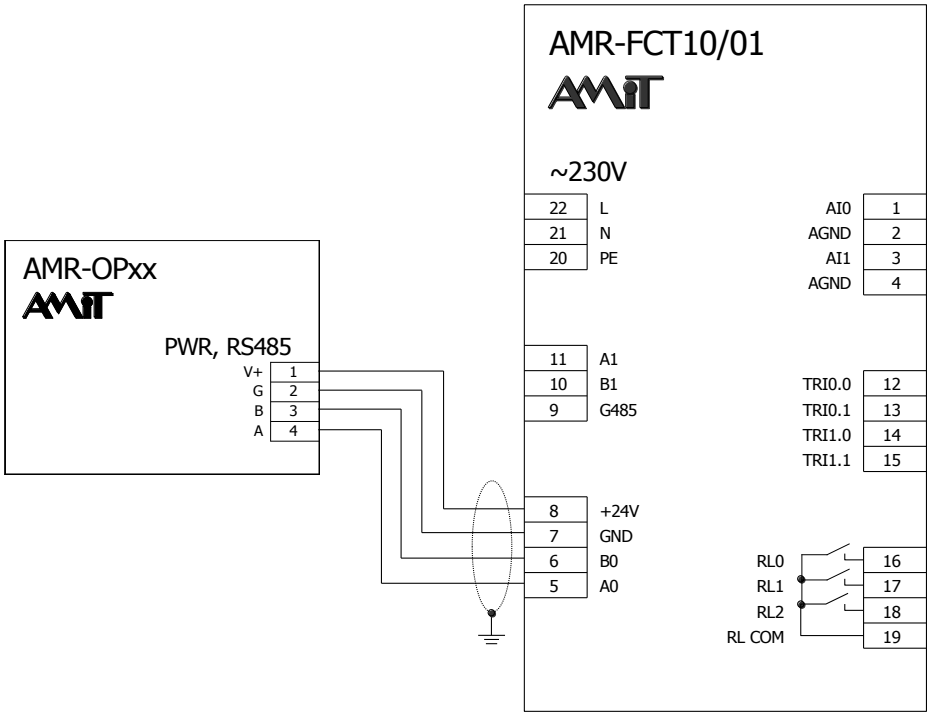

Fig. 7 – Wiring example of on-wall controller connection to **AMR-FCT10/01**

Note It is recommended to use structured cabling for power supply and RS485 wiring during installation. For power connection, it is recommended to use one pair of wires for positive terminal and second pair for negative terminal. Cable shielding must be connected in a single point to a PE terminal on the side of the power supply source.

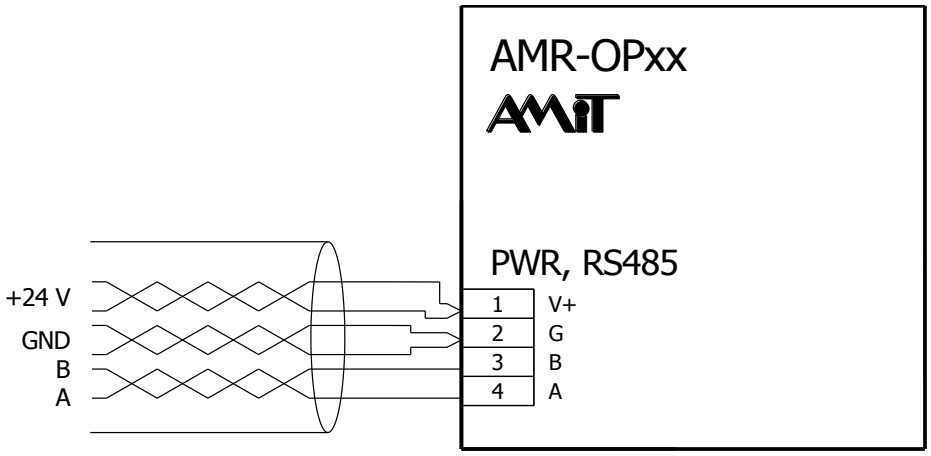

Fig. 8 – Structured cabling use example

5.2 RS485 with galvanic isolation (COM1)

Up to 255 stations can be connected to RS485 with GI. It can be used for, e.g. communication with superior control system.

RS485 interface activity is indicated by LEDs located on front panel.

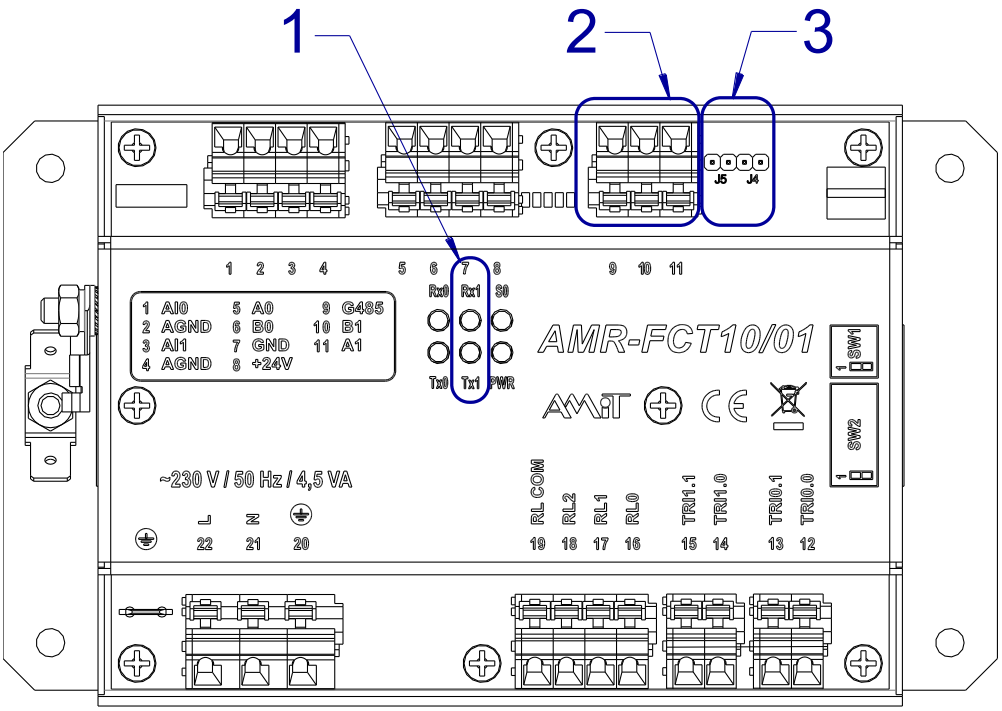

Fig. 9 – Terminals and LEDs location for RS485 with GI

Legend

Number	Description
1	Status LEDs for RS485 with GI
2	Terminals for RS485 with GI
3	Configuration jumpers

Terminals wiring

Terminal	Signal	Description
9	G485	RS485 interface with GI, ground
10	B1	RS485 interface with GI, signal B
11	A1	RS485 interface with GI, signal A

RS485 status LEDs

LED	Description
Rx1	Controller is receiving data
Tx1	Controller is transmitting data

Each station in RS485 network must have properly set terminating resistor and idle states definition. Configuration jumpers located near the RS485 connector are used for termination setting.

Jumpers description

Jumper	Description
J4	Signal A idle state + termination
J5	Signal B idle state + termination

Jumpers	Description
Are set	Terminal station – idle states and wires termination are active.
Are not set	Intermediate station – idle states and wires termination are inactive.

More information about the RS485 interface use can be found in application note *AP0016 – Principles of RS485 interface usage*.

6 Inputs/outputs

6.1 RTD inputs

The programmable controller **AMR-FCT10/01** contains 2 RTD (resistance temperature detector) inputs. RTD inputs can be used as:

- analogue inputs for sensors connection,
  - Ni1000 with sensitivity 6180 ppm or with sensitivity 5000 ppm,
  - Pt1000,
- dry contact digital inputs.

The inputs are marked as analogue inputs on the label.

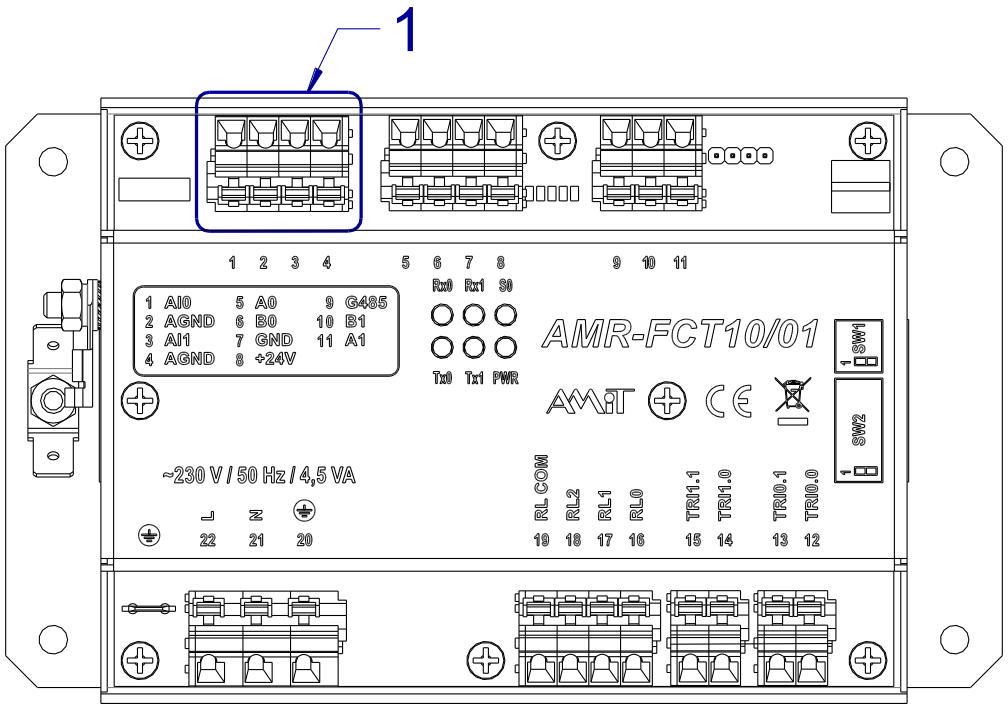

Fig. 10 – Location of terminals for RTD inputs

Legend

Number	Description
1	Terminals for RTD inputs

Terminals marking

Terminal	Signal	Description
1	AI0	RTD input 0
2	AGND [9])	RTD input ground
3	AI1	RTD input 1
4	AGND [9])	RTD input ground

Note [9]) Terminal AGND is internally connected with controller terminal GND.

Wiring examples

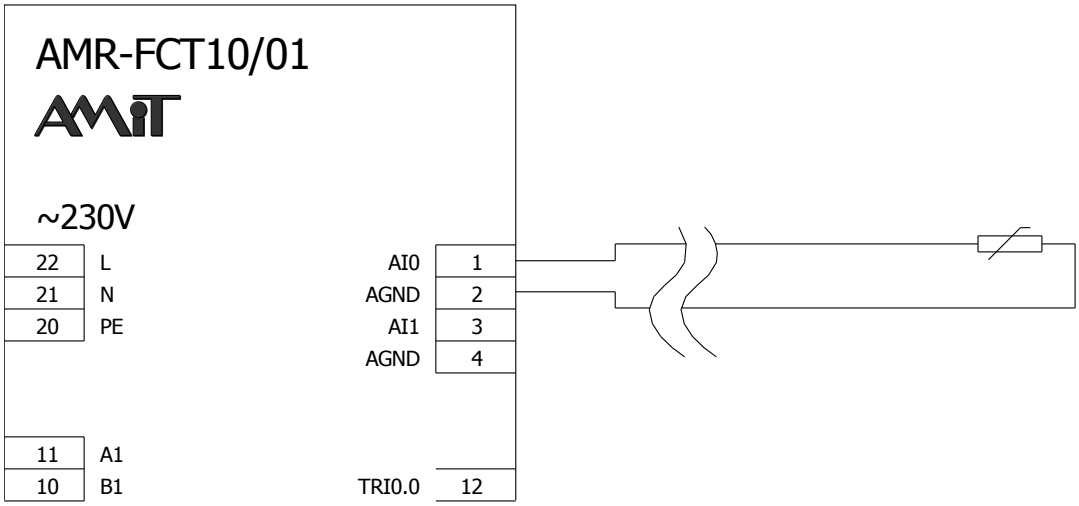

Fig. 11 – Temperature sensor wiring example

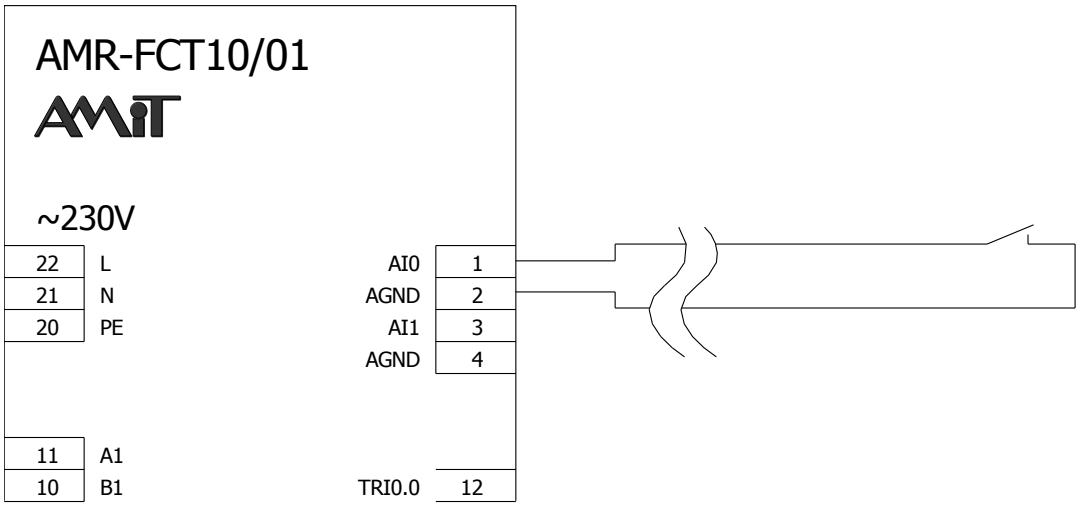

Fig. 12 – Dry contact wiring example

6.2 Relay outputs

The programmable controller **AMR-FCT10/01** contains 3 relay outputs, connected as switching relays with common conductor.

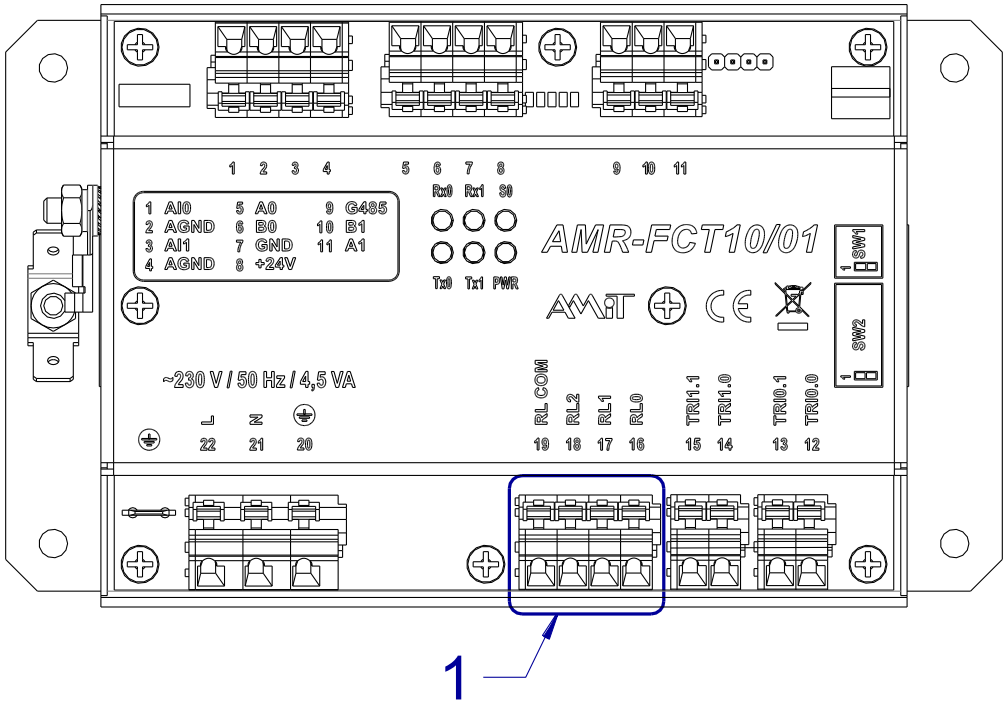

Fig. 13 – Terminals location for relay outputs

Legend

Number	Description
1	Terminals for relay outputs

Terminals marking

Terminal	Signal	Description
16	RL0	Relay output 0
17	RL1	Relay output 1
18	RL2	Relay output 2
19	RL COM	Common input relay terminal 0, 1 and 2

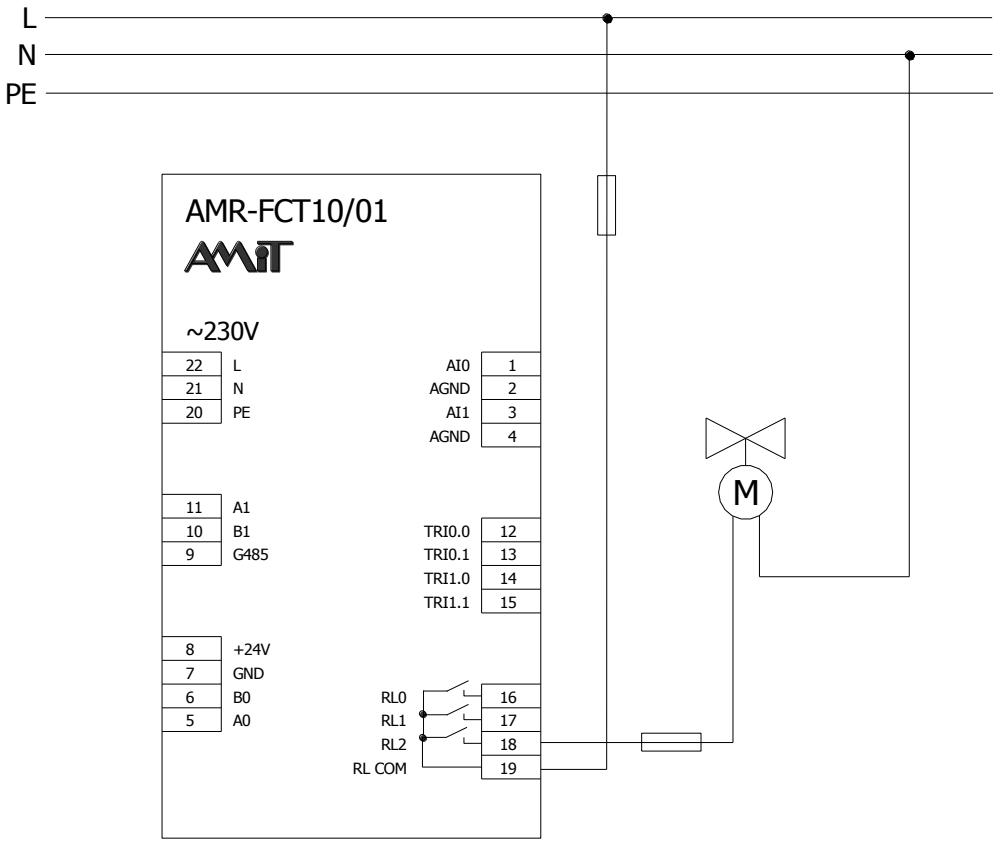

Fig. 14 – Relay output wiring example

6.3 Triac outputs

The controller **AMR-FCT10/01** contains 2 triac outputs (13, 15), e.g. suitable for the valve thermoelectric actuators. Each from the triacs has its individual power supply input (12, 14). The triacs must be fused externally.

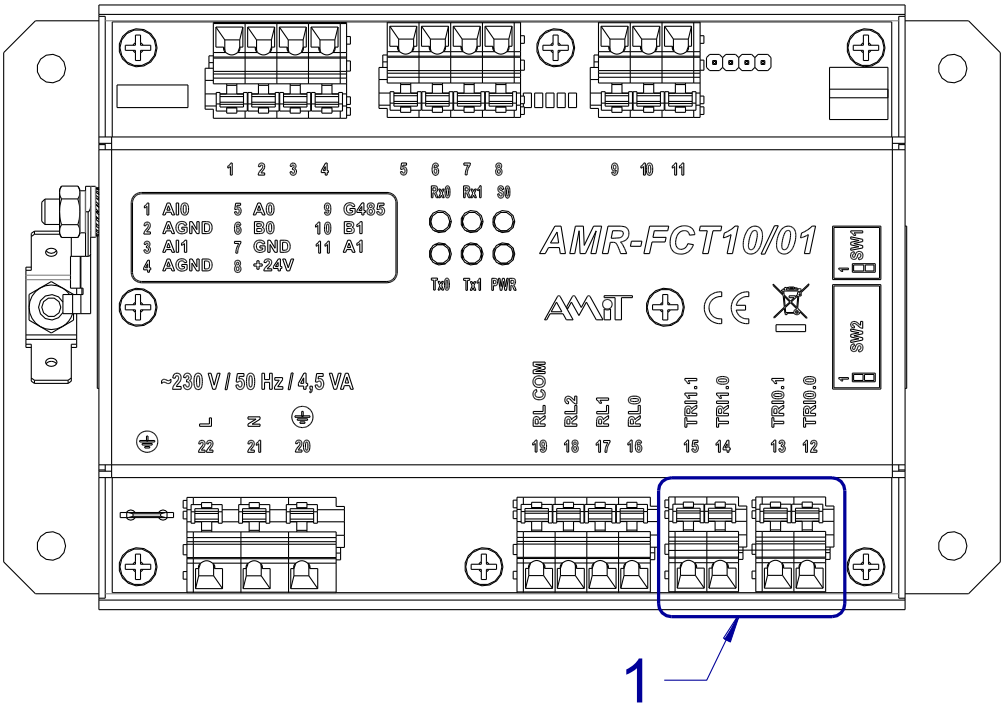

Fig. 15 – Location of triac outputs terminals

Legend

Number	Description
1	Triac terminals

Terminals marking

Terminal	Signal	Description
12	TRI0.0	Triac output 0
13	TRI0.1	Triac output 0
14	TRI1.0	Triac output 1
15	TRI1.1	Triac output 1

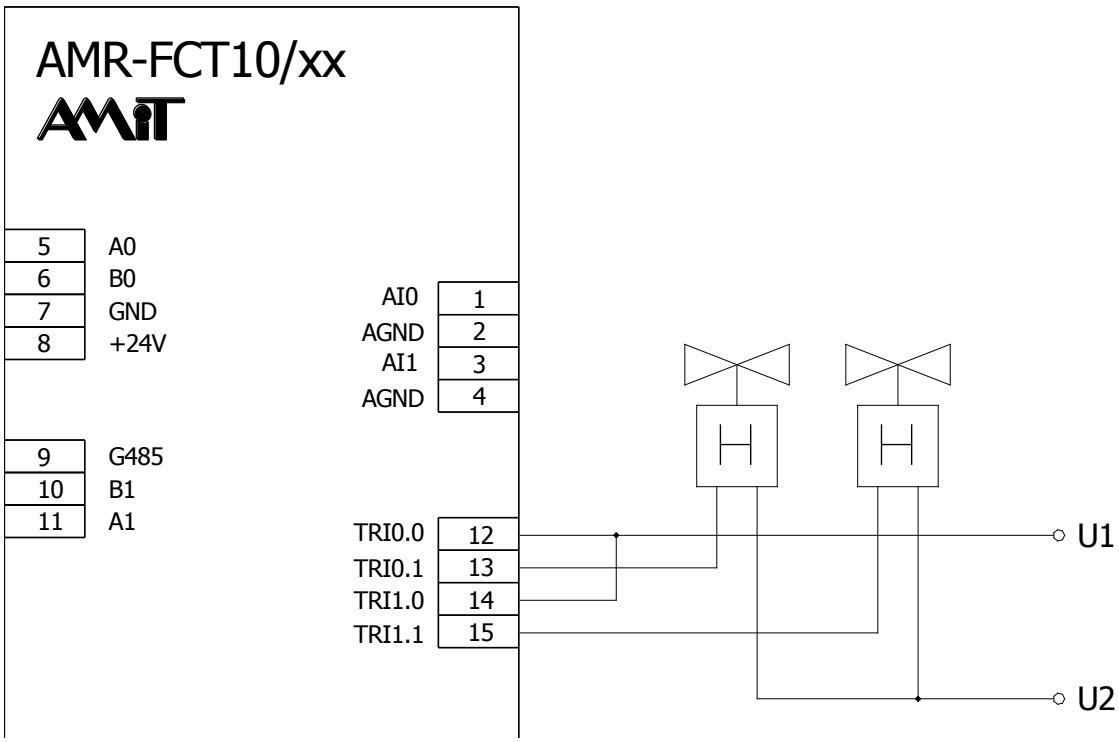

Fig. 16 – Triac output wiring example

7 Mounting

The controller **AMR-FCT10/01** is intended to be mounted on the switchboard base plate (eventually on the wall or to the dropped ceiling). It can be mounted in any position.

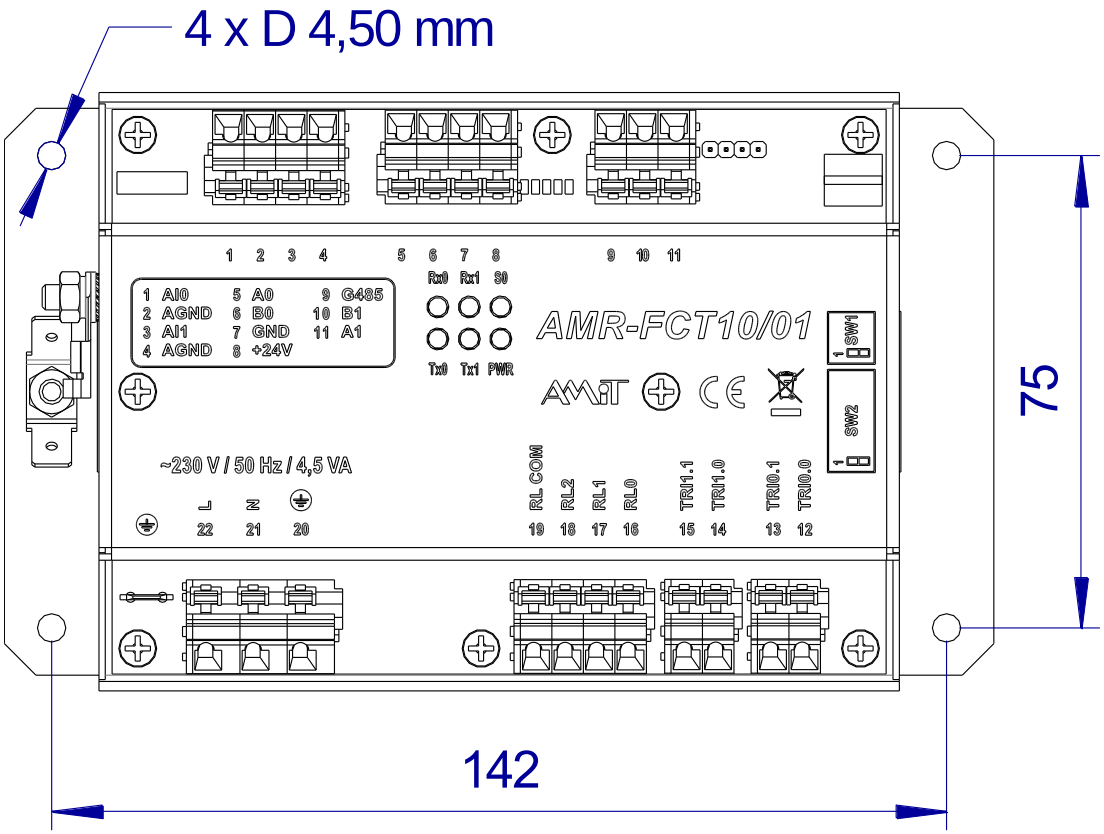

Fig. 17 – Dimensions of mounting holes

7.1 Installation rules

EMC filter Use an EMC filter on 230 V AC power supply voltage input. This requirement can be revised on the basis of environment character and wiring layout.

Main power inlet A bi-polar switch must be used as disconnecting element, alternatively circuit breaker with coupled break contact. The disconnecting element must be: implemented into the installation, placed in close vicinity of the equipment, available for operator and it must be marked as disconnecting element of equipment.

Protection The equipment must be protected with external circuit breaker.

Connection with PE It is recommended to connect the negative supplying terminal of unit GND (terminal no. 7) on input to the switchboard PE terminal.

Relay outputs Cabling must be installed so that accidental release of any single wire does not bring main voltage on safe part and vice versa.

Maximum current in the bulb is greater than its nominal current. Either the short-time value of switched current must not overcome its maximum allowed value.

If the inlet wires are led outside the building, the appropriate outputs need to be overvoltage protected.

RTD inputs Use shielded cables for analogue signals connection. Connect the cable shielding to the PE terminal immediately on switchboard input.

Use shielded wires for RTD inputs in digital input mode in environments with higher interference levels and for longer cablings. Connect the cable shielding to the PE terminal immediately on switchboard frame input.

If the inlet wires are led outside the building, the appropriate outputs need to be overvoltage protected.

RS485 It is necessary to perform RS485 interface connection according to recommendations in application note *AP0016 – Principles of RS485 interface usage*.

Note All PE terminal connections must be realized with the lowest impedance as possible. Technical parameters of the equipment are guaranteed only when these wiring principles are applied.

On-wall controller It is necessary to turn off the controller power supply voltage before the on-wall controller is connected.

8 Programming and setting

The programmable controller **AMR-FCT10/01** is factory-programmed with Loader that allows uploading of user application.

This own application can be created through:

- DetStudio / EsiDet development environment

Application uploading into the controller can be performed only through RS485 with galvanic isolation (COM1). It can be done through:

- DetStudio development environment
- AMRconfig service and programming utility
- AMRmultidownload multiprogramming utility

SW download Development environment is free to download from www.amitomation.com.

8.1 Communication parameters setting

8.1.1 RS485 without galvanic isolation (COM0)

It is necessary to set the communication parameters (address, communication speed and parity) in application created in EsiDet part of DetStudio environment.

8.1.2 RS485 with galvanic isolation (COM1)

Two sets of DIP switches located on the controller side serve for communication parameters setting.

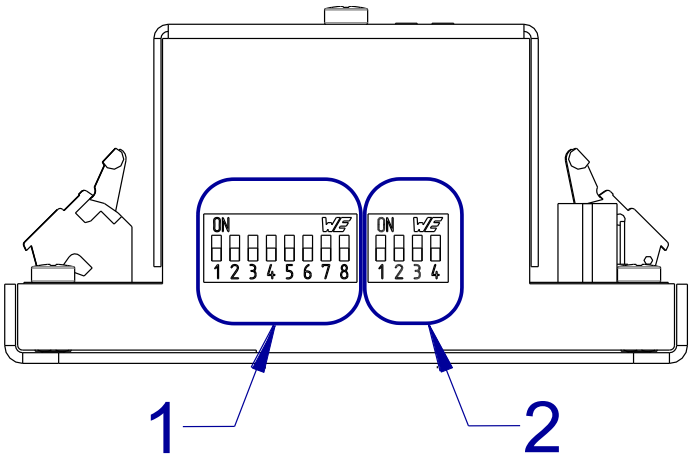

Fig. 18 – DIP switch location for communication parameters setting

Legend

Number	Description
1	DIP switches SW2
2	DIP switches SW1

Switch description

Switches	Description
SW1	Communication speed and parity setting
SW2	Controller address setting

PC connection The controller **AMR-RTV10/01** must be connected to the PC through RS485 converter (for example a type **SB485s** from AMiT production) in point – to – point connection.

Follow the Help for presented SW equipment to change the parameters.

Note Communication with the controller can be established from DetStudio only through MODBUS communication protocol (e.g. anytime after loader activation, see chapter “8.3 Loader”).

DIP SW1 – communication speed and parity setting

All devices must have identical parity and communication speed in network. Parity (if not given by communication protocol) and communication speed can be set by different DIP switches combination according to the tables.

SW1.1	SW1.2	SW1.3	Speed	Parity
OFF	OFF	OFF	9 600	According to SW1.4
ON	OFF	OFF	19 200	According to SW1.4
OFF	ON	OFF	38 400	According to SW1.4
ON	ON	OFF	57 600	According to SW1.4
OFF	OFF	ON	9 600	Without parity, SW1.4 setting is meaningless
ON	OFF	ON	19 200	Without parity, SW1.4 setting is meaningless
OFF	ON	ON	38 400	Without parity, SW1.4 setting is meaningless
ON	ON	ON	115 200	According to SW1.4

SW1.4	Parity
OFF	even
ON	odd

Number of stop bits is set automatically according to selected parity:

Even parity	1 stop bit
Odd parity	1 stop bit
Without parity	2 stop bits

DIP SW2 – address setting

The programmed controller occupies a single network address. Each device must have a unique network address (usable addresses range is given by communication protocol). Address can be set by DIP switches combination according to the table.

				SW2.8	OFF	OFF	OFF	OFF	ON	ON	ON	ON
				SW2.7	OFF	OFF	ON	ON	OFF	OFF	ON	ON
				SW2.6	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW2.1	SW2.2	SW2.3	SW2.4	SW2.5	Module address in network							
OFF	OFF	OFF	OFF	OFF	0	32	64	96	128	160	192	224
ON	OFF	OFF	OFF	OFF	1	33	65	97	129	161	193	225
OFF	ON	OFF	OFF	OFF	2	34	66	98	130	162	194	226
ON	ON	OFF	OFF	OFF	3	35	67	99	131	163	195	227
OFF	OFF	ON	OFF	OFF	4	36	68	100	132	164	196	228
ON	OFF	ON	OFF	OFF	5	37	69	101	133	165	197	229
OFF	ON	ON	OFF	OFF	6	38	70	102	134	166	198	230
ON	ON	ON	OFF	OFF	7	39	71	103	135	167	199	231
OFF	OFF	OFF	ON	OFF	8	40	72	104	136	168	200	232
ON	OFF	OFF	ON	OFF	9	41	73	105	137	169	201	233
OFF	ON	OFF	ON	OFF	10	42	74	106	138	170	202	234
ON	ON	OFF	ON	OFF	11	43	75	107	139	171	203	235
OFF	OFF	ON	ON	OFF	12	44	76	108	140	172	204	236
ON	OFF	ON	ON	OFF	13	45	77	109	141	173	205	237
OFF	ON	ON	ON	OFF	14	46	78	110	142	174	206	238
ON	ON	ON	ON	OFF	15	47	79	111	143	175	207	239
OFF	OFF	OFF	OFF	ON	16	48	80	112	144	176	208	240
ON	OFF	OFF	OFF	ON	17	49	81	113	145	177	209	241
OFF	ON	OFF	OFF	ON	18	50	82	114	146	178	210	242
ON	ON	OFF	OFF	ON	19	51	83	115	147	179	211	243
OFF	OFF	ON	OFF	ON	20	52	84	116	148	180	212	244
ON	OFF	ON	OFF	ON	21	53	85	117	149	181	213	245
OFF	ON	ON	OFF	ON	22	54	86	118	150	182	214	246
ON	ON	ON	OFF	ON	23	55	87	119	151	183	215	247
OFF	OFF	OFF	ON	ON	24	56	88	120	152	184	216	248
ON	OFF	OFF	ON	ON	25	57	89	121	153	185	217	249
OFF	ON	OFF	ON	ON	26	58	90	122	154	186	218	250
ON	ON	OFF	ON	ON	27	59	91	123	155	187	219	251
OFF	OFF	ON	ON	ON	28	60	92	124	156	188	220	252
ON	OFF	ON	ON	ON	29	61	93	125	157	189	221	253
OFF	ON	ON	ON	ON	30	62	94	126	158	190	222	254
ON	ON	ON	ON	ON	31	63	95	127	159	191	223	255

Attention *All switch setting changes take their effect only after controller restart (power supply disconnection and connection).*

8.2 LED S0

LED S0 serves for indication of a module software application state.

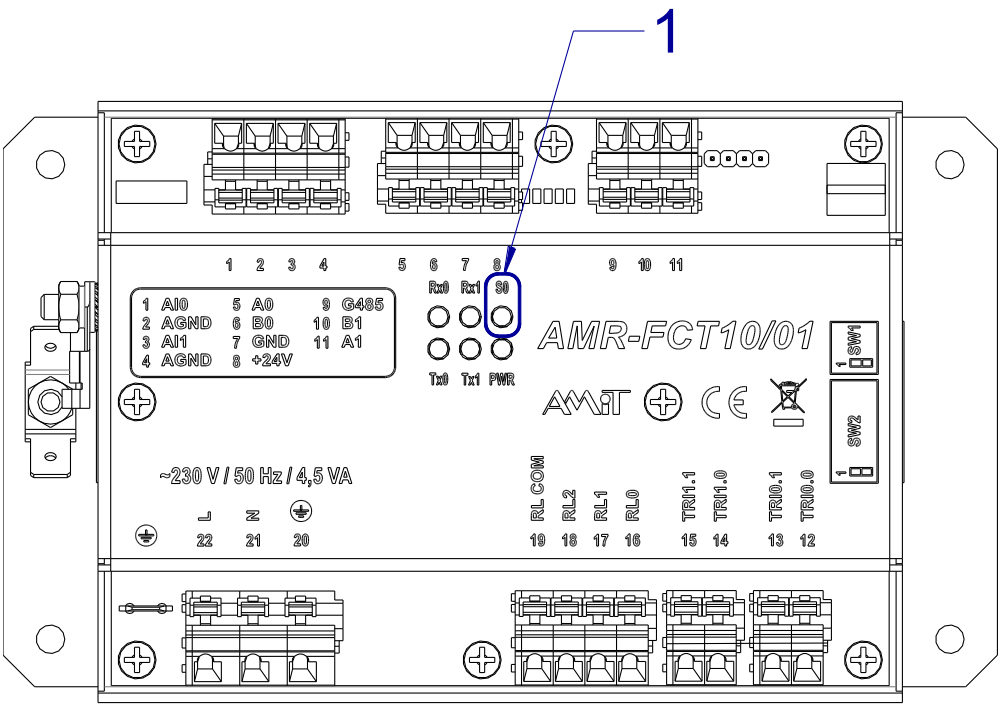

Fig. 19 – LED S0 location

Legend

Number	Description
1	LED S0

LED S0 indicates different software application states by flashing with different period and length.

LED	Light	Description
S0	Flashing 0.1 s For a period 1 s	Reset passage indication.
	Regular flashing with period 0.2 s	Loader is launched.
	Regular flashing with period 1 s	Application is launched.
	Irregular flashing with period 0.5 s	Running application is indicating error. Irregular flashing means that 2 s pause follows after a particular number of flashes. Number of flashes between two pauses indicates numeric error code: 1 – BackUp RAM reading error, 2 – error during reading from EEPROM, 3 – suspiciously frequent writing to EEPROM, 15 – unknown error.

8.3 Loader

Loader running state can be used in cases the user application is causing any troubles, e.g. repeated restarting, controller connection inability, etc.

Loader activation

Loader can be activated by turning service DIP switch inside the controller. Service switch is accessible after a cover removal.

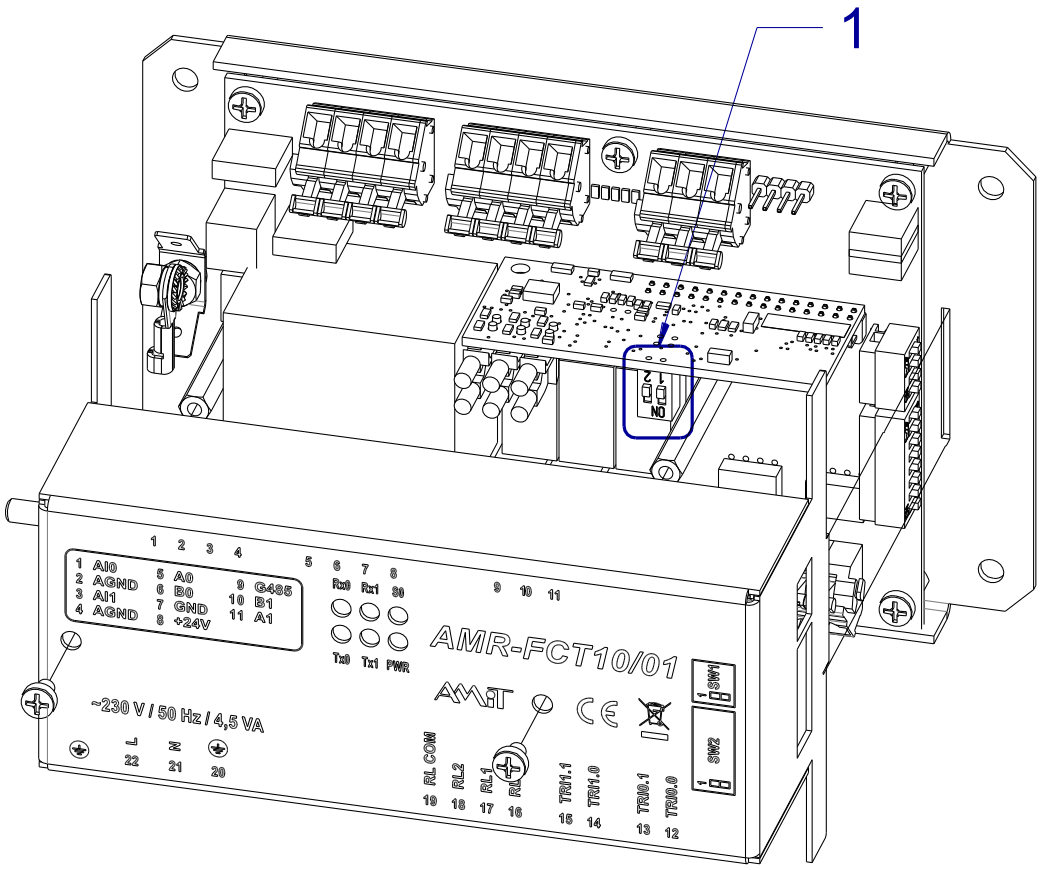

Fig. 20 – Service DIP switch location

Legend

Number	Description
1	DIP switches for loader activation

Particular action is called-out according to a moment and duration of a button press, see following table.

Service DIP

DIP 2 in position ON	Action
> 1 s After turning-on	Loader with communication parameters set on DIP switches (SW1 a SW2) is launched.
> 3 s During application run	Loader with communication parameters set on DIP switches (SW1 a SW2) is launched.

Note *The service DIP 2 must be set to OFF during common application run and after Loader activation.*

9 Factory settings

RS485 configuration

The RS485 interface (COM1) is fitted with jumpers that activate wires termination and idle state definition.

Software application settings of interface COM1

Communication protocol MODBUS RTU. Communication parameters are set according to position DIP SW1 and DIP SW2.

10 Ordering information and completion

FanCoil controller	**AMR-FCT10/01**	Complete, see chapter 10.1 Completion

10.1 Completion

AMR-FCT10/01

Part	Quantity
FanCoil unit controller	1

11 Maintenance

With exception of cleaning, the device requires no periodic control, nor maintenance.

Cleaning Time after time it is necessary to remove a dust from the device according to the way of use. The device can be cleaned by dry soft brush or vacuum cleaner, only when turned-off and disassembled.

Note **The maintenance mentioned above can be performed by manufacturer or authorized service only!**

12 Waste disposal

Electronics disposal A disposal of the device is governed by regulations on handling electrical waste. The device must not be disposed in common public waste. It must be delivered to places specified for that purpose and recycled.